

IN THE CLAIMS:

Please add the following claims:

- c1
- 1        ~~51.~~<sup>31</sup> (New) A catadioptric optical system comprising:
- 2            a catadioptric type optical system, which includes a lens
- 3        element, a first reflecting surface and a second reflecting
- 4        surface that reflects light coming from said first reflecting
- 5        surface, light coming from said second reflecting surface
- 6        passing said first reflecting surface off-axis thereof, at
- 7        least one of said first and second reflecting surfaces being a
- 8        concave reflecting surface, for forming an intermediate image
- 9        from an object of a first plane surface; and
- 10           a refraction type optical system for forming a second
- 11        image onto a second plane surface,
- 12           wherein, said catadioptric type optical system and said
- 13        refraction type optical system are disposed between said first
- 14        and second plane surfaces, and
- 15           said first plane surface, said second plane surface and
- 16        an image plane of said intermediate image are parallel to each
- 17        other.

1        <sup>32</sup>  
52. (New) A catadioptric optical system according to  
2        <sup>31</sup>  
Claim 51, wherein said catadioptric type optical system and  
3        said refraction type optical system are disposed on a single  
4        linear optical axis.

1        <sup>33</sup>  
53. (New) A catadioptric optical system according to  
2        <sup>31</sup>  
Claim 51, wherein said catadioptric type optical system  
3        includes a lens group including at least one positive lens,  
4        and said refraction type optical system includes an aperture  
5        diaphragm.

1        <sup>34</sup>  
54. (New) A catadioptric optical system according to  
2        <sup>31</sup>  
Claim 51, wherein an exit pupil of said catadioptric optical  
3        system is substantially circular.

1        <sup>35</sup>  
55. (New) A catadioptric optical system according to  
2        <sup>31</sup>  
Claim 51, wherein the following condition is satisfied:  
3         $0.04 < |fM1| / L < 0.4$   
4        wherein fM1 is a focal length of said concave reflecting  
5        surface of said first or second reflecting surface, and L is a

6 distance along the optical axis from said first surface to  
7 said second surface.

1 <sup>36</sup>  
56. (New) A catadioptric optical system according to  
2 <sup>31</sup>  
Claim 51, wherein the following condition is satisfied:

3  $0.6 < |\beta_{M1}| < 20$

4 wherein  $\beta_{M1}$  is a magnification of said concave reflecting  
5 surface of said first or second reflecting surface.

1 <sup>37</sup>  
57. (New) A catadioptric optical system according to  
2 <sup>31</sup>  
Claim 51, wherein the following condition is satisfied:

3  $0.3 < |\beta_1| < 1.8$

4 wherein  $\beta_1$  is a magnification of said catadioptric type  
5 optical system.

1 58. (New) A catadioptric optical system according to  
2 Claim 51, wherein said catadioptric type optical system  
3 includes a lens group including at least one lens element  
4 whose surface is asymmetric, and said refraction type optical  
5 system includes at least one lens element whose surface is  
6 asymmetric.

1        <sup>39</sup>  
59. (New) A catadioptric optical system according to  
2        <sup>31</sup>  
Claim 51, wherein at least one of said first and second  
3        reflecting surfaces is a concave reflecting surface that  
4        corrects positive Petzval sum created by said lens element.

Cont'd  
1        <sup>40</sup>  
60. (New) A catadioptric optical system according to  
2        <sup>31</sup>  
Claim 51, wherein the catadioptric optical system has both-  
3        sides telecentricity.

1        <sup>41</sup>  
61. (New) A catadioptric optical system according to  
2        <sup>31</sup>  
Claim 51, wherein said refraction type optical system includes  
3        two kinds of glass material.

Sub  
53  
1        <sup>42</sup>  
62. (New) A projection exposure apparatus which  
2        projects a predetermined pattern on a mask onto a  
3        photosensitive substrate, wherein said catadioptric optical  
4        system according to Claim 51, <sup>31</sup> projects said predetermined  
5        pattern onto said photosensitive substrate.